

FIRST RECORD OF *PTEROMALUS LEUCANTHEMI* JANZON (HYMENOPTERA: PTEROMALIDAE) IN BRITAIN, WITH NOTES ON IDENTIFICATION AND BIOLOGY

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ABSTRACT

The first record of *Pteromalus leucanthemi* Janzon from Britain (Surrey) is presented. Specimens were reared from galls of the tephritid fly *Tephritis neesii* (Meigen). Notes on the biology and identification of *P. leucanthemi*, and detailed comparisons with *P. albipennis* Walker, are provided.

INTRODUCTION

The chalcidoid genus *Pteromalus* currently contains approximately 350 species in Europe of which 60 are known to occur in the UK (Noyes, 2001). The northwest European species were treated in detail by Graham (1969) under the genera *Pteromalus* and *Habrocytus* (Graham, 1969). *Habrocytus* has since been synonymised with *Pteromalus* (Bouček & Graham, 1978). *Pteromalus* species have a wide range of biologies, and include gregarious endoparasitoids of Lepidoptera pupae, endoparasitoids of solitary and social aculeate Hymenoptera pupae, and endoparasitoids of Coleoptera. *Pteromalus* species have also been reared as hyperparasitoids, often facultative, in the cocoons of Ichneumonidae and Braconidae, or from the pupae of other chalcidoids. Egg-predation in spider egg-sacs has also been recorded (Noyes, 2001). While the genus as a whole exhibits very broad host relations, individual species are mostly highly specialised, with respect both to overall biology and actual host range.

Graham (1969) divided this large genus (as *Habrocytus*) into a number of species-groups. His *albipennis*-group consists entirely (where the biology is known) of primary endoparasitoids of Tephritidae (Diptera) in galls on a wide variety of Asteraceae. This paper records the recent discovery in Britain of one member of this tephritid-specific group, *Pteromalus leucanthemi* Janzon.

A study was initiated in early spring 2001 to demonstrate how the colonisation of plant roots by arbuscular mycorrhizal fungi can alter insect parasitoid performance, through effects on the host plant and host insect (in this case leaf-mining larvae and flower-feeding species). The work involved detailed field observations of potted plants of *Leucanthemum vulgare* Lam. (Oxeye Daisy), within a wild flower meadow community rich in this species. Plants with reduced levels of mycorrhiza (controls) were compared with those to which different combinations of mycorrhizal species inoculum had been added.

On 20 June 2001, the second author (DA) reared four individuals (3♀ 1♂) of a chalcidoid from the flowerhead of an experimental control plant (reduced mycorrhiza) of *L. vulgare* infested with larvae of the tephritid, *Tephritis neesii* (Meigen), in the grounds of CABI Bioscience at Egham (SU996697). The flowerhead was collected on the 3 June 2001 and placed into a paper bag with a clear plastic

front. The adult pteromalids emerging were later identified by the first author (AP) as *Pteromalus leucanthemi* Janzon.

IDENTIFICATION OF *PTEROMALUS LEUCANTHEMI* (Plate 1, A–F; Figs 1–10)

Identification of *P. leucanthemi* was undertaken initially using Graham's (1969) key, in which female specimens keyed out approximately to *P. albipennis* Walker. However, Janzon's description (1980) of *P. leucanthemi*, based on material reared from the same host on the same host plant (*T. neesii* on *L. vulgare*), also agreed well with the newly-collected specimens. In the original description of *P. leucanthemi*, Janzon did not compare it with *P. albipennis*, but with *P. cardui* (Erdős) and *P. musaeus* (Walker). Both *P. albipennis* and *P. leucanthemi* differ from *P. cardui* in having the median area of the propodeum less transverse (see Graham, 1980:497, fig. 373). *Pteromalus musaeus* has the setae on the underside of the costal cell in a complete row (incomplete in *P. albipennis* and *P. leucanthemi*). Morphological differences between *P. albipennis* and *P. leucanthemi* appear to be very few. Based on Graham's figure of the female *P. albipennis* clypeus (Graham, 1980: 501, fig. 394), it is less deeply incised in that species than in *P. leucanthemi* (Plate 1, C), although this character is not visible in the lectotype of *P. albipennis*. There are some additional differences in propodeal structure between the females of the two species, *P. albipennis* (female lectotype) having more extensive reticulation in the median area. Janzon (1986) carried out an extensive morphometric study of the *albipennis*-group, measuring 24 pairs of length ratios for 10 putative species. His results show considerable overlap between the two species here considered, in all ratios measured. The three most promising character ratios presented by Janzon are post ocellar length/ocellar-ocular length, scutellar breadth/length, and eye height/scape length. Of these, the first two ratios are identical in the two species, based on the material examined, and the last character is not visible in the lectotype of *P. albipennis*. Further comparative morphological studies were therefore carried out using the material available in the collections of the Natural History Museum, London. Specimens identified as *P. albipennis* were partially dissected and slide mounted. Fore wings, female and male antennae and male genitalia were compared with those of *P. leucanthemi* (figs 1–10). Several differences were noted as discussed below, but the interpretation of these differences must be subject to the usual caveats of reliability concerning identification of this difficult group of species, and the possibility of much greater variation encountered in larger samples. Thus it is with some reservation that the new material is here identified as *P. leucanthemi* and newly recorded from Britain.

Differences noted between *P. leucanthemi* and *P. albipennis*: female antenna (figs 1,2) relatively more slender in *P. leucanthemi* (fig. 2), scape as long as funicle segments F1–F4. Scape shorter than F1–F4 in *P. albipennis* (fig. 1). Male antennae (figs 3,4) also relatively more slender in *P. leucanthemi* (fig. 4). F6 quadrate in *P. albipennis* (fig. 3), longer than wide in *P. leucanthemi* (fig. 4). Flagellar segments with contrasting light and dark areas in *P. leucanthemi* (fig. 4), of more uniform colour in *P. albipennis* (fig. 3). Fore wings (female, figs 5,6) with postmarginal vein very slightly longer in *P. leucanthemi*; angle between stigmal and postmarginal veins slightly more acute in *P. leucanthemi* (fig. 6). Male genitalia very similar (figs 7,8); digiti each with five teeth in *P. albipennis* (fig. 9) and four in *P. leucanthemi* (fig. 10), the inter-volsellar region apparently convex in *P. albipennis* (arrowed fig. 7, detail fig. 9) and planar in *P. leucanthemi* (arrowed fig. 8, detail fig. 10). This last difference could be an artifact of slide-mounting.

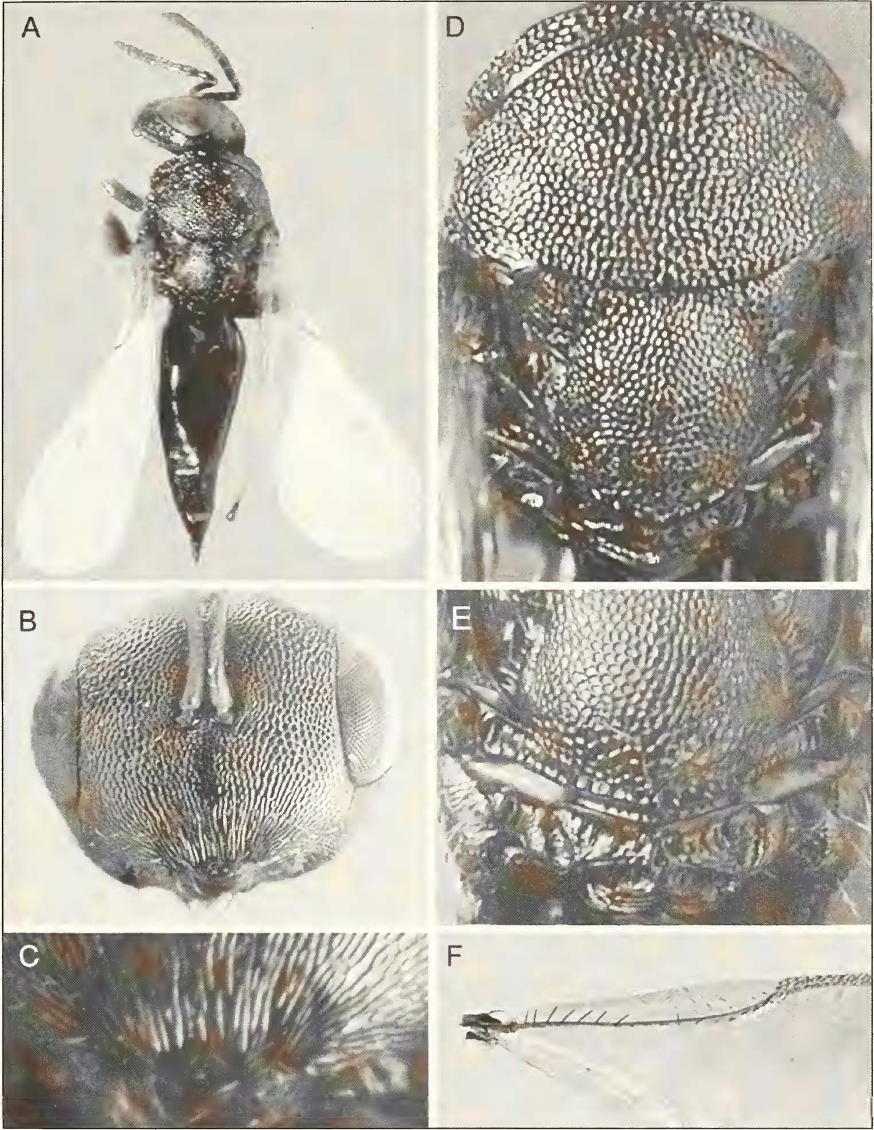
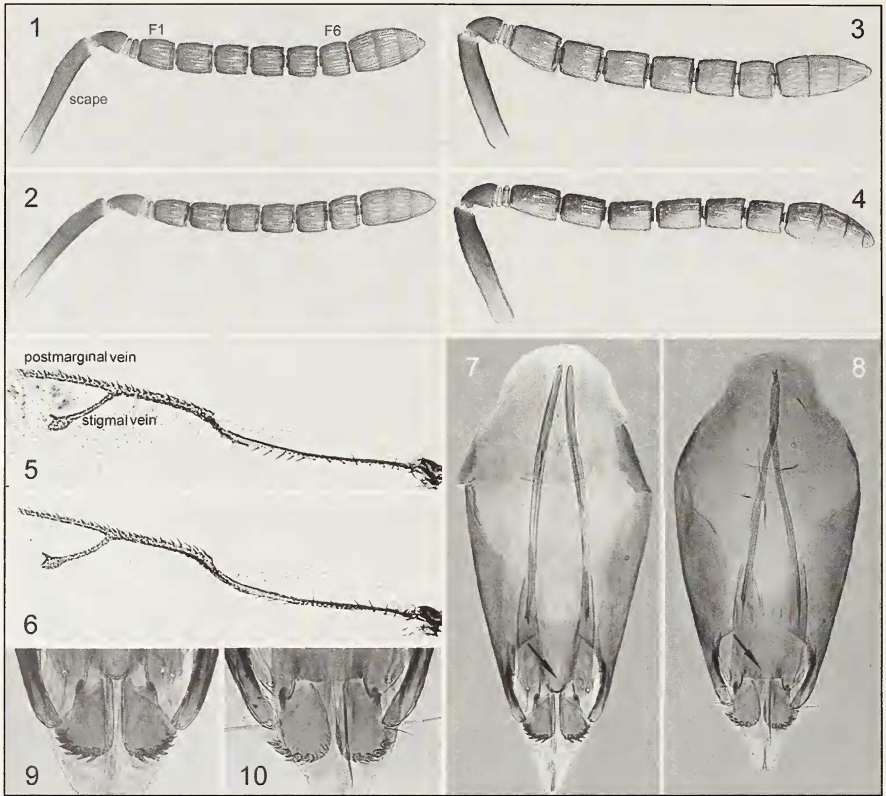


Plate 1. A–F *Pteromalus leucanthemis* female: A: habitus; B: face; C: clypeus; D: mesosoma; E: distal mesosoma; F: base of fore wing.



Figs 1–10: 1. *Pteromalus albipennis* female antenna; 2. *P. leucanthemi* female antenna; 3. *P. albipennis* male antenna; 4. *P. leucanthemi* male antenna; 5. *P. albipennis* female fore wing; 6. *P. leucanthemi* female fore wing; 7. *P. albipennis* male genitalia; 8. *P. leucanthemi* male genitalia; 9. *P. albipennis* male genitalia, detail; 10. *P. leucanthemi* male genitalia, detail.

Material examined: *Pteromalus albipennis* Lectotype ♀: [UK] Isle of Wight. BM Type: HYM 5.3376. 2♀ 3♂ UK: [Surrey?, Kew?] “bred from head of *Centaurea nigra*” (G.C. Varley) [various collection dates, 1932–35].

Pteromalus leucanthemi Janzon: 3♀ 1♂ UK: England, Surrey, Egham. ex *Tephritis neesii* in flowerheads of *Leucanthemum vulgare* (D. Aplin). col. 3.vi.2001 em. 20.vi.2001.

All specimens deposited in the Natural History Museum, London.

BIOLOGY OF *PTEROMALUS LEUCANTHEMI*

This appears to be the only record of this species since its description by Janzon (1980). As with other species of the *Pteromalus albipennis* species-group, it is a primary parasitoid of tephritid larvae in flowerheads of Asteraceae (Compositae), in this case, *L. vulgare*. It would appear that in this species group, the adult female lays

an egg in the fully-grown host larva. The parasitoid wasp pupates in, and emerges as an adult, from the puparium of the host (Janzon, 1984).

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BOOK REVIEW

Butterflies in Slovenia. By David Withrington. LeWit (privately published), Soft cover, 39 pp, plus back cover map. Peterborough, 2003

This is a super booklet, and attractively produced with a scatter of colour photos of habitats and butterflies. It is a personal review of experiences from 14 visits to Slovenia, during which 138 species were recorded. Notes are given for each species, together with information on selected localities arranged under ecological regions. The author's love and passion for Slovenia shines through, and is reflected in his choice of publishing privately. As a Slovenia fan myself, and one who has delighted in seeing the butterflies there, I feel some other BENHS members should also enjoy this booklet. David is generously offering to send it free to those who provide him with a self-addressed A5 envelope bearing a second class 34p stamp for return in UK: his address is 21 Lawn Avenue, Peterborough PE1 3RA.

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